NOTE XIII.

CARCINOLOGICAL STUDIES IN THE LEYDEN MUSEUM.

BY

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N°. 4. [1])
(Plate 3—6).

LIST OF SPECIES.

Carpilodes tristis *Dana*.
Actaeodes Richtersii *de Man*.
Xantho punctatus *H. Milne Edw*.
" (Lachnopodus) tahitensis *de Man*.
" nudipes *A. Milne Edw*.
Lophozozymus superbus *A. Milne Edw*. (nec *Dana*).
Leptodius gracilis *Dana*.
Chlorodopsis areolata *H. Milne Edw*.
Heteropanope serratifrons *Kinahan*.
Pilumnus globosus *Dana*.
" tahitensis, n. sp.
Trapezia guttata *Rüpp*. (*Heller*).
" flavopunctata *Eyd. & Soul*.
Eriphia scabricula *Dana*.
Goniocaphyra truncatifrons *de Man*.
Xenophthalmodes Moebii *Richters*.
Geryon trispinosus *Herbst*.
Macrophthalmus crassipes *H. Milne Edw*.
" pacificus *Dana*.
Myctiris longicarpus *Latr*.
Leptograpsus Ansoni *H. Milne Edw*.
Pachygrapsus crassipes *Randall*.
Plagusia speciosa *Dana*.
Clistocoeloma merguiensis *de Man*.
Sesarma Aubryi *A. Milne Edw*.
" Edwardsii *de Man*, var. brevipes *de Man*.
" Smithii *H. Milne Edw*.
" atrorubens *Hess*.
" trapezoidea *Guérin*.
" quadrata *Fabr*.
" erythrodactyla *Hess*.
" bataviana, n. sp.
" barbimana, n. sp.
Eupagurus hirtimanus *White*.
Calcinus elegans *H. Milne Edw*.
" nitidus *Heller*.
Clibanarius vulgaris *Dana*.
" taeniatus *H. Milne Edw*.
Alpheus pachychirus *Stimpson*.
Hetairocaris orientalis, n. g. et n. sp.
Penaeus Macleayi *Haswell*.

1) See for N°. 1 and 2: Vol. III, p. 121 and p. 245, and for N°. 3: Vol. V, p. 150.

1. *Carpilodes tristis* Dana.

Carpilodes tristis, Dana, United States Exploring Expedition, Crustacea, T. I, p. 193, Pl. IX, fig. 7.

One male from Tahiti.

The nearest ally of this species is *Carpilodes laevis* A. Milne Edwards. Of this latter form I have before me a male specimen from Amboina, which I have described two years ago (Archiv f. Naturgeschichte, Jahrg. LIII, p. 236), and so I am able to indicate the differences. Unfortunately the cephalothorax of the specimen of *tristis* is somewhat asymmetric posteriorly, which is probably caused by a parasite in the left postero-lateral region of the carapace.

The cephalothorax of *Carpil. tristis* is a little more enlarged than that of the other species. The interregional grooves are somewhat more distinct; therefore the urogastric areola 4 M is already visible to the naked eye, which is not the case in *Carpil. laevis*. The posterior of the two grooves which border the third lobe of the antero-lateral margins, is considerably longer in *Carpil. tristis*, so that an imaginary line, which unites the extremities of these grooves, coincides with the posterior border of the areola urogastrica. The whole upper surface of the cephalothorax of *tristis* proves to be very minutely granulated when examined under a strong magnifying-glass, but when *Carpil. laevis* is observed under the same lens, this minute granulation is only seen on the front and close to the antero-lateral margins.

The legs of *Carpil. tristis* are shorter in proportion to the width of the cephalothorax, and the ambulatory legs especially have a less slender form. Thus e. g. the last pair of legs of *Carpil. laevis* are about as long as the breadth of the cephalothorax, measured at the incisions between the second and the third lobe of the antero-lateral margins; the posterior legs of *Carpil. tristis* are, however, much shorter than that distance.

The dark brown colour of the fingers of Dana's species extends for a short distance along the lower margin of the hand; this is not the case with the specimen of *Carpil. laevis* which lies before me, but the specimen figured by Milne Edwards (Nouvelles Archives du Muséum, T. IX, Pl. 5, fig. 3*a*) presents the same character.

The breadth of the cephalothorax is $15^2/_3$ mm., its length 9 mm. These measurements are for *Carpil. laevis* respectively $16^1/_2$ mm. and 10 mm.

Heller (Novara-Reise) likewise records *Carpil. tristis* from Tahiti, and according to Milne Edwards this species is rather common on the shores of New Caledonia.

2. *Actaeodes Richtersii* de Man.

Actaeodes Richtersii, de Man, in: Zoologische Jahrbücher, herausgegeben von J. W. Spengel, Abth. f. Systematik, Bd. IV, S. 412, Taf. 9, fig. 2. 1888.

An adult female and a very young male from Tahiti.

Both specimens agree entirely with the original description founded upon an adult male, but the hands of the female differ somewhat in form from those of the male. The hands are namely somewhat shorter and more slender; they are a little more than three times as long as high, whereas in the adult male the height of the palm measures a little more than a third of the length. As regards the proportion between the horizontal length of the palm and that of the fingers, the female agrees with the male, but the palm is distinctly more than once and a half as long as high. The inner margins of both fingers are entire and excavated for some distance at the distal end; that entire, untoothed part of the margin is slightly longer than half the length of the margin in the immobile finger, slightly shorter than half the length of the margin in the dactylus; as regards the number and the form of the teeth, the female agrees with the male. The hiatus between the fingers when closed is slightly larger than in the male.

In the young male individual the lead-coloured tint of the index does not yet cover the distal part of the palm, which is the case in the adult male.

Dimensions of the female:

Distance between the external orbital angles	$11^4/_5$ mm.
Greatest width of the cephalothorax . . .	$29^1/_4$ »
Length of the cephalothorax	$15^2/_5$ »
Length of the hand	$13^1/_3$ »
Height of the palm	$4^1/_6$ »

3. *Xantho punctatus* H. Milne Edw.

(Pl. 3, fig. 1).

Xantho punctatus, H. Milne Edwards; A. Milne Edwards, Nouvelles Archives du Muséum, T. IX, p. 199, Pl. VII, fig. 6. — de Man, in: Archiv f. Naturgeschichte, Jahrg. 53, 1888, p. 238.

The collection contains two fine adult specimens, a male and a female, of which the locality is unknown.

The two chelipedes of the female have the same size and agree entirely with the figure published by Milne Edwards. In the male the right chelipede (fig. 1) is considerably larger than the left. The black colour of the fingers extends somewhat farther in the male than in the female, as may be seen when comparing my figure of the larger hand of the male with that of the hand of the female in the »Nouvelles Archives."

Dimensions:	♂	♀
Greatest breadth of the cephalothorax	49 mm.	$42^2/_3$ mm.
Length of the cephalothorax . . .	30 »	26 »
Distance between the external orbital angles	$20^1/_2$ »	$17^1/_5$ »
Length of the larger hand	$40^1/_2$ »	
Height of the larger hand	$16^1/_2$ »	

4. *Xantho (Lachnopodus) tahitensis* de Man.

Xantho (*Lachnopodus*) *tahitensis*, de Man, in: Zool. Jahrbücher, Abth. f. System. Bd. IV, 1888, S. 418, Taf. IX, fig. 4.

A male and a young female from Tahiti.

The chelae of the female fully agree with those of the male; in both the right chela is the larger.

5. *Xantho nudipes* A. Milne Edw.

Confer: de Man, in: Zoolog. Jahrb. Bd. IV, 1888, p. 420.

A young male and a female, which are of the same size.

The female is ova-bearing. The whole upper surface of the cephalothorax presents the small impressions and grooves that are characteristic to this species, whereas, according to Milne Edwards, only the anterior part should be covered with them. In the male the right chelipede is the larger, in the female the left. The extremities of the fingers are scarcely excavate.

Dimensions:	♂	♀
Greatest width of the cephalothorax	$21^1/_2$ mm.	$20^3/_4$ mm.
Length of the cephalothorax . . .	$14^1/_4$ „	$13^3/_4$ „
Distance between the external orbital angles	9 „	$8^3/_4$ „

6. *Lophozozymus superbus* A. Milne Edw. (*nec* Dana).

Lophozozymus superbus, A. Milne Edwards, Nouvelles Archives du Muséum, T. IX, p. 205. — de Man, in: Archiv f. Naturgeschichte, Jahrg. 53, 1888, p. 269, Taf. X, Fig. 3*b*.

One male and an ova-bearing female from Upolu.

I have already said (l. c.) that *Lophozozymus superbus* A. Milne Edwards is a species different from *Lophozozymus superbus* Dana, the latter being identical with *Lophozozymus incisus* M. Edw. The cephalothorax of *Loph. superbus* A. Milne Edw. attains a breadth of 55 mm.; our two individuals from Upolu have, however, only half that size, though the female is already provided with eggs. The chelae of the female are equal in size, the upper margin of the palm is slightly and obtusely carinated along its proximal half and the fingers are slightly grooved in a longitudinal

direction. The black colour of the fingers extends a little on the base of the immobile finger in the male, but not in the female.

The upper surface of the cephalothorax is beautifully marbled with red on a paler ground-colour and the under surface presents numerous small round, reddish spots.

Dimensions of the female:

Breadth of the cephalothorax	27	mm.
Length „ „ „	16	„
Distance between the external orbital angles	$13^1/_4$	„

This species has also been recorded from New Caledonia.

7. *Leptodius gracilis* Dana.

Chlorodius gracilis, Dana, l. c. p. 210, Pl. XI, fig. 13.

Leptodius gracilis, de Man, in: Archiv f. Naturgeschichte, Jahrg. 53, 1888, S. 287, Pl. XI, fig. 2.

Two young male specimens from Ponapé.

Quite as was the case with the male from the Java Sea, described by me (l. c.), also in these two individuals the cephalothorax is slightly more enlarged than in the typical specimens of *Leptodius exaratus*, in which the fingers of the hands have no hiatus between them, when closed. I therefore think *Leptodius gracilis* to be a »good" species. The upper surface of the cephalothorax is shining, what is denied by Dana.

The dimensions of the larger specimen are as follows:

Width of the cephalothorax	18	mm.
Length „ „ „	11	„

8. *Chlorodopsis areolata* H. Milne Edw.

Chlorodopsis areolatus, A. Milne Edwards, Nouvelles Archives du Muséum, T. IX, p. 231, Pl. VIII, fig. 8.

A young male from the Fiji islands.

In this species all the regions of the upper surface are very distinctly developed and separated from one another

by deep grooves. The regions 2 M are each divided by a distinct groove in two secondary areolae, the mesogastric areola 3 M is tripartite and separated moreover from the areola 4 M. The areola cardiaca 1 P is separated by rather deep grooves from the areolae 3 R and 2 P; the anterior margin of this areola 1 P presents a narrow emargination in the middle, but this groove does not extend to the posterior margin, so that the two halves of this lobule are united with one another posteriorly. The short close down, that presents the upper surface of the cephalothorax, does not cover the small rounded granules, which are found on the areolae. Sternum and abdomen are somewhat punctate, but appear for the rest nearly smooth.

The right chelipede is a little larger than the left. The wrist is armed with a rather acute tooth at the internal angle of the upper surface and with a very acute spine below that tooth at the inner angle of the under surface. The hands are covered above and externally with numerous conical, rather acute tubercles, that are arranged more or less in transverse series. The lower margin of the hand is rounded and smooth. The fingers are sulcate. The upper margin of the dactylus presents two rows of acute tubercles until the middle; some small tubercles are also found on the index, a transverse row of tubercles of the palm extending on the immobile finger. The inner margin of the index presents three conical teeth, that of the dactylus also three, of which the proximal one is the largest.

The ambulatory legs are covered with the same close down as the upper surface of the carapace and are moreover densely hairy on the margins; the mero-, carpo- and propodites are armed with small sharp spines on their anterior margins.

The cephalothorax is $11^{2}/_{5}$ mm. broad and $7^{4}/_{5}$ mm. long.

This species inhabits the seas of Australia, New Caledonia and the Fiji islands.

9. *Heteropanope serratifrons* Kinahan.

(Pl. 3, fig. 2).

Ozius? serratifrons, Kinahan, The Journal of the Royal Dublin Society, Vol. I, 1856, p. 118, Pl. IV, fig. 1.

Pilumnopeus serratifrons, Haswell, Catalogue of the Australian Stalk- and Sessile-eyed Crustacea, 1882, p. 70, Pl. II, fig. 1.

One young male, bearing a *Sacculina*, from the Pacific Ocean.

This species somewhat resembles *Heteropanope indica* de Man from the Mergui Archipelago, but differs by the following characters. The upper surface of the cephalothorax of *Heterop. serratifrons* is a little convex, especially anteriorly, that of *Heterop. indica* rather depressed. (I may observe that Kinahan describes the cephalothorax as »slightly depressed", Haswell however as »very convex, both in the transverse and the antero-posterior direction"!) The cephalothorax is also a little less enlarged in proportion to the length as that of *Heterop. indica*. The front is a little broader than in the Mergui species, the distance between the internal orbital angles being somewhat longer than the third part of the greatest width of the cephalothorax. Kinahan says in his latin diagnosis, that the postero-lateral margins are nearly twice as long as the antero-lateral (margine postero-laterali contractâ, quam margine ant. lat. fere bis longiore), and afterwards he says that the antero-lateral margin scarcely attains the edge of the genital region. In our specimen, which is evidently a young one, the antero-lateral margins are somewhat shorter than the postero-lateral, their length being about in proportion as 5 : 7. The antero-lateral margins are armed with four teeth, the first of which forms the little prominent external orbital angle. This first lobe is nearly straight or very slightly emarginate and has nearly the same form as in *Heterop. indica*; the second lobe is considerably longer than the

first and obtusely rounded anteriorly. The second antero-lateral lobe of *Heterop. indica* on the contrary is a little narrower than the first. The two posterior teeth are much smaller, triangular, tooth-like and subacute; the third tooth is a little larger than the fourth.

The anterior half of the upper surface of the cephalothorax presents the same transverse, minutely granulated, pubescent lines as that of *Heterop. indica.* Immediately below the first antero-lateral lobe, the subhepatic region presents some more or less prominent granules; Kinahan describes them in the adult as »a small spine", Haswell as a »tubercular eminence." The flagellum of the outer antennae is longer than that of *Heterop. indica* and but little shorter than half the breadth of the cephalothorax. The abdomen does not fully agree with Kinahan's figure, the joints appear comparatively a little broader; the penultimate joint is distinctly broader than long, that of *Heterop. indica* nearly quadrate.

The left chelipede is the larger one. The upper margin of the arm has an acute tooth immediately before the distal end. The wrist presents an acute tooth at its internal angle and the upper surface is somewhat granular. The larger hand (fig. 2) is a little more than once and a half as long as high, and the horizontal length of the fingers is but little more than half the horizontal length of the palm. The hand is minutely granulate on its upper margin and close to the articulation with the wrist, though in our young specimen the granules are only visible by means of the magnifying glass. The outer surface of the hand appears smooth for the naked eye, and very minutely granular under a strong lens. The dactylus is short, curved and somewhat granular at the base; this finger is not grooved, but presents two or three rows of impressed points. The immobile finger is distinctly sulcate on its outer surface, and armed with two or three teeth; the dactylus presents also three teeth, of which the two proximal ones are smaller than the opposite teeth of the index. The lower margin of

the palm is in a straight line with the lower margin of the immobile finger.

The fingers of the smaller hand are comparatively a little longer and the impressed points on the dactylus are deeper, the upper forming partly a groove; the upper and the posterior margin of the palm and the lower part of the outer surface are granular, and still much smaller granules are observed, by means of a strong magnifying-glass, on the rest of the outer surface. The fingers have pointed tips.

The hairy ambulatory legs are rather much compressed and resemble those of *Heterop. indica*, but the dactylopodites are still somewhat longer and are distinctly longer than the propodites.

Heteropanope australiensis Stimpson has five antero-lateral teeth and cannot therefore be identical with our species, as Haswell thought.

It is impossible to decide whether *Pilumnopeus crassimanus* A. Milne Edw. from Port Western is identical with Kinahan's species, because the description is too short.

The upper surface of the cephalothorax is of a dark brown olive-green colour, the antero-lateral margins, the orbital margins and the frontal lobes are yellowish red, and the upper surface seems to be marked with a few reddish spots, as e. g. at the two fissures of the upper orbital margin. The upper sides of the anterior legs and the ambulatory legs have nearly the same colour; the outer surface of the hands is of a pale reddish, and the fingers are dark brown, the brown colour gradually growing paler towards the tips.

	♂
Greatest width of the cephalothorax	$15^2/_3$ mm.
Length of the cephalothorax, without the frontal lobes	$11^2/_3$ »
Length of the cephalothorax, with the frontal lobes	12 »
Distance between the internal orbital angles .	6 »
Length of the larger hand, fingers included .	$11^1/_2$ »

Length of the palm . . . . . $7^1/_2$ mm.
Height of the palm near the articulation with the fingers . . . . . 7 »

In adult specimens the cephalothorax has a breadth of $1^1/_4$ inch and is then twice as large as our individual.

Heteropanope serratifrons Kinahan inhabits the eastern coast of Australia and New Zealand.

10. *Pilumnus globosus* Dana.
(Pl. 3, fig. 3).

Pilumnus globosus, Dana, l. c. p. 236, Pl. XIII, fig. 10.

Two specimens (♂ and ♀) of which the locality is unknown.

The cephalothorax of this species is rather thick, and, being but little broader than long, greatly resembles the species of the genus *Actumnus*. The upper surface is very convex in the antero-posterior direction; the regions are very faintly indicated and the sutures defining the gastric region are scarcely visible. The upper surface is covered with a few scattered, small granules and densely with rather short yellowish hairs. The front is very narrow, the distance between the internal angles of the orbits measures scarcely a third of the greatest width of the cephalothorax. It is much deflexed, prominent and divided in two lobes by a narrow but deep incision. The finely granulated and straight margins of these two frontal lobes run obliquely backward and are not separated by an incision from the upper orbital margins, quite as in the genus *Sphaerozius* Stimps. The external orbital angle is formed by a small rather acute granule, the inferior orbital margin presents some similar granules and the internal angle of the latter terminates in a somewhat larger granule. The basal joint of the outer antennae is very short and even the second joint does not yet reach the frontal margin; the length of the flagellum is still a little shorter than the breadth of the front. The antero-lateral margins are a little longer than the postero-lateral ones; they are entire, and orna-

mented, behind the external orbital angles, anteriorly with three small granules, placed at some distance from one another. The postero-lateral margins are slightly concave. The pterygostomian regions are smooth: a few granules are only observed quite near the inferior orbital margins. The endostome is distinctly ridged. Sternum and abdomen are punctate, but for the rest smooth; the penultimate joint of the abdomen in the male is somewhat broader than long.

The anterior legs are unequal both in the male and in the female. The larger hand (fig. 3) is very thick and its outer surface very convex; the latter is covered everywhere, as well on the upper as on the lower margin, with numerous granules, which are not arranged in transverse series, but irregularly. These granules are rather sharp close to the articulation with the wrist, but they become gradually more numerous, smaller and more obtuse towards the fingers. The fingers are short, smooth and not grooved; a few very small granules are only seen quite at the base of the dactylus, when observed under a magnifying-glass, and these granules are placed in a transverse row.

The granules, with which the smaller hand is covered, are less numerous, larger, conical, acute and more or less arranged in transverse rows. The dactylus is somewhat hairy at the base and presents here two or three longitudinal rows of acute granules; similar granules are also found at the outer surface of the immobile finger, which is slightly grooved. The larger hand is only slightly hairy on the proximal half of its outer surface, but the outer surface of the smaller hand is hairy until the base of the fingers. The fingers are black, with white pointed tips; each of them is armed with two or three white teeth.

The dimensions of the female are follows:

Greatest width of the cephalothorax	16	mm.
Length of the cephalothorax	$13^1/_3$	„
Distance between the internal orbital angles .	$4^2/_3$	„
„ „ „ external „ „ .	$10^1/_4$	„

This species is most closely allied to *Pilumnus actumnoides* A. Milne Edw., which inhabits New Caledonia, but in this form the frontorbital margin of the upper surface of the carapace is comparatively broader, according to the figure published by Milne Edwards, the small teeth of the antero-lateral margins are more numerous and more prominent, and the outer surface of the larger hand is covered with less numerous granules. The dactylus of *Pilumnus actumnoides* seems to be also a little more granulate above.

Pilumnus globosus was discovered by Dana at the island of Tahiti and at some other islands of the Pacific Ocean, and was observed by the Challenger Expedition in the Japanese Seas.

11. *Pilumnus tahitensis*, n. sp.

(Pl. 3, fig. 4).

Two specimens (♂ and ♀) from Tahiti.

This very interesting new species may at first sight be distinguished from its numerous congeners by the fingers of the chelipedes which have exactly the same structure as those of *Pilumnus cristimanus* A. Milne Edw., and by the antero-lateral margins of the carapace being armed with the typical number of acute spines, just as in the typical forms of the genus.

The cephalothorax is a little broader than long. Its upper surface is rather depressed, only declivous towards the front and slightly so towards the antero-lateral margins. The regions are not or very faintly indicated; the upper surface appears smooth and shining between the scattered tufts of hair, but slightly uneven, though scarcely distinguishable, at the insertion of every tuft of hairs. The hairs, with which the upper surface is covered, are partly long, silken and pale yellowish, partly pinnate. They arise in transverse rows on the front at some distance from the margin. The front is rather prominent, less broad than half the breadth of the cephalothorax,

and divided by a triangular notch in two lobes which are directed somewhat obliquely backward. The margins of the frontal lobes are nearly straight, scarcely a little sinuous, and are not separated by any incision from the obtuse internal orbital angles. The frontal margins are smooth and not granular, quite as the upper surface of the cephalothorax. The orbits are large and slightly broader than half the width of the front. The eye-peduncles are hairy.

The upper margin of the orbits is not granulate, but hairy; the external angle is formed by a triangular, acute and rather prominent tooth, close to which the upper margin presents still a much smaller, triangular lobe. The acute tooth at the extraorbital angle is separated by a deep, triangular hiatus from the lower margin of the orbits; this hiatus is a little broader in the female than in the male.

The external half of the inferior margin of the orbits is entire, the internal angle dentiform, acute, hairy and rather prominent (fig. 4*a*) and two or three much smaller teeth are observed between the internal tooth and the external half of the lower margin. The interior hiatus of the orbits is rather wide and spacious; the basal joint of the antennal peduncle is considerably shorter than the internal suborbital tooth and does by far not reach the front. The second joint reaches to the upper surface of the front and the third joint is almost as long as the second. The flagellum is glabrous and as long as the breadth of the front.

The antero-lateral margins are distinctly shorter than the postero-lateral. They are armed with three very acute spiniform teeth, which are equally distant from one another as from the dentiform external orbital angle. The subhepatic region bears several small and acute tubercles, one of which is larger than the others and dentiform (fig. 4*a*). The pterygostomian regions are somewhat granular. The endostome is distinctly ridged. The merus-joint of the outer foot-jaws is quadrangular, its anterior margin straight or scarcely concave and the external angle obtusely rounded.

The penultimate joint of the male abdomen is somewhat broader than long. The sternum and abdomen are slightly pubescent.

With the exception of the fingers and of the inner surface of the hands, the anterior legs are covered with hairs which are partly long, silken and yellowish, partly pinnate and which resemble those, found on the upper surface of the cephalothorax. In the male the right chelipede is a little larger than the left; unfortunately the female specimen has lost the right leg, so that I cannot say whether they are equal or not. The upper margin of the arms bears two sharp spiniform teeth, one at the distal end, the second a little before it; a small spiniform tooth is also observed at the proximal end of the anterior margin. A sharp conical granule is found at the internal angle of the wrist and a few similar conical and acute granules are dispersed on the upper surface which is covered with long hairs.

The fingers of the larger hand (fig. 4*b*) are about as long as the palm, those of the smaller hand distinctly longer. The palm is covered above and externally with rather long hairs and between these hairs with a few sharp conical granules, which resemble those of the upper surface of the wrist; these granules decrease in size towards the inferior margin.

The fingers present exactly the same form and structure as those of *Pilumnus cristimanus*; the crests on the outer surface of the fingers are however less acute and more obtuse, and the sharp inner edge of the immobile finger, which is quite entire in *Pilumnus cristimanus*, presents, at least in the male, four or five very small incisions. The fingers are smooth all over, and present no trace of granulation, even at the base of the dactylus, but at the uncoloured base of the latter a few long hairs are implanted.

The ambulatory legs, which are covered with long hairs, are comparatively long and their propodites are nearly as

long as the dactylopodites; the upper margins of the mero- and of the carpopodites are armed with a spiniform tooth at the distal end. The hairs which are found on these legs are also partly pinnate.

Pilumnus tahitensis is closely allied to *Pilumnus vestitus* Haswell from Port Jackson (vide Miers, Challenger Expedition, Brachyura, p. 159, Pl. XIV, fig. 3), but is distinguished at first sight by the remarkable structure of the fingers.

Dimensions:	♂	♀
Breadth of the cephalothorax, lateral teeth included	$10^2/_3$ mm.	10 mm.
Length of the cephalothorax	$7^2/_3$ »	$7^1/_2$ »
Distance between the external orbital angles	$7^1/_2$ »	$7^2/_5$ »

12. *Trapezia guttata* Rüpp. (Heller).

Trapezia guttata Rüppel, Heller, in: Sitzungsber. Kais. Acad. der Wissensch. in Wien, Bd. XLIII, p. 351.

Trapezia guttata, Miers, Report on the Challenger Brachyura, 1886, p. 166, Pl. XII, fig. 1.

Two specimens, male and female, from Samoa.

Quite as in the specimens described (l. c.) by Miers, also in our specimens the ambulatory legs alone are marked with small red spots. The cephalothorax is a little broader in proportion to the length than that of *Trapezia cymodoce* Herbst.

Our species is also distinguished by the frontal teeth being but little developed and by the glabrous outer surface of the hands.

The lateral teeth of the cephalothorax are sharp and acute as in *Trap. cymodoce*; the hands are much compressed and their upper margin is rather sharp, not rounded.

Dimensions:	♂	♀
Breadth of the cephalothorax, distance between the lateral teeth	$12^3/_4$ mm.	$12^2/_3$ mm.
Length of the cephalothorax	$10^1/_4$ »	$9^3/_4$ »

13. *Trapezia flavopunctata* Eyd. & Soul.

Trapezia flavopunctata, Eydoux & Souleyet, Voyage de la Bonite, Tome I, p. 230, Pl. 2, fig. 3.

Trapezia latifrons, A. Milne Edwards, Nouvelles Archives du Muséum, Tome IX, p. 259, Pl. X, fig. 7.

Three adult specimens (2 ♂ and 1 ♀) from Tahiti and two very young males the locality of which is unknown.

The two young males certainly belong to *Trap. latifrons* A. Milne Edw. and agree completely with the description and the figure of that species. They differ from the three adult individuals almost only by having the areolae of the reticulate pattern on the cephalothorax larger and less numerous. This species may be distinguished at first sight from *Trap. areolata* Dana: 1° by the general shape of the cephalothorax, 2° by the granulate lower margin of the hands, and 3° by the areolae. In *Trap. areolata* Dana the areolae are much smaller and much more numerous and do not exist on the ambulatory legs. The lateral teeth of the cephalothorax are less sharp in the adult than in the young, and this is also the case with the acute tooth at the internal angle of the wrist of the anterior legs. In adult specimens the upper-, as well as the lower surface of the cephalothorax is marked with a net of areolae, which are a little larger than those of *Trap. areolata*; these areolae are also seen on both sides of the anterior legs. Spot-like red transverse bands exist on the ambulatory legs, two or three on the meropodites, and one on the carpo- and propodites.

I finally may observe that this species differs from *Trap. rufopunctata* Herbst exclusively by the pattern, showing in any other respect the most complete resemblance with it.

The largest specimen, a female, has the following dimensions:

Distance between the external orbital angles $20^1/_4$ mm.

Length of the cephalothorax . . . . . 17 mm.
Breadth of the front, measured between the eyes 13 »

In the smallest specimen, a male, the measurements are as follows:
Distance between the external orbital angles . . 11 mm.
Length of the cephalothorax . . . . . $8^1/_4$ »
Breadth of the front, measured between the eyes $6^4/_5$ »

14. *Eriphia scabricula* Dana.

Eriphia scabricula, Dana, l. c. Tome I, p. 247, pl. XIV, fig. 5.

A female and a younger male from unknown locality.

I have before me a young male of *Eriphia laevimana*, var. *Smithii*, collected in the Javan Sea, which I have described some time ago (Archiv f. Naturgeschichte, Bd. 53, 1888, p. 327), so that I am enabled to point out the slight differences existing between this form and *Eriphia scabricula*. The cephalothorax of Dana's species is slightly more enlarged. The post-frontal lobes 2 F are not separated in this species from the regions 1 M by a transverse groove, but form one single region with the latter and the regions 2 M; in *Eriphia laevimana* the post-frontal lobes 2 F are on the contrary separated from the areolae 1 M by distinct smooth transverse grooves. These areolae 2 F and 1 M are more finely granulated in *scabricula* than in the other form. The median incision of the front is slightly wider, and the anterior margins of the two arcuate frontal lobes are not or only very finely granulated, but very distinctly so in *Eriphia laevimana*. The granulation on the outer surface of the hands is somewhat closer and finer in *Eriphia scabricula*, and the upper surface of the cephalothorax and the hands are always hairy in the species described by Dana.

The largest specimen, the female, has the following dimensions:

Breadth of the cephalothorax 19 mm.
Length » » » $12^3/_4$ »
Breadth of the front . . . $9^3/_4$ »

These measurements are in the male of *Eriphia laevimana*, var. *Smithii*, respectively 18 mm., $12^3/_4$ mm. and 9 mm.

15. *Goniocaphyra truncatifrons* de Man.

Goniocaphyra truncatifrons, de Man, in: Archiv f. Naturgeschichte, 1888, Bd. 53, p. 339, Pl. XIV, fig. 1.

This species is identical with *Catoptrus nitidus* A. Milne Edw.

At the time when I described the *Goniocaphyra*, I supposed *Catoptrus nitidus* to be a quite different form, especially because I was led to the opinion that the *Goniocaphyra* ought to be referred to the Portunidae on account of its presumptive affinities with the genus *Caphyra* Guérin.

Prof. Milne Edwards kindly sent me his own drawing of *Catoptrus nitidus*, which has never been published as far as I am aware. The cephalothorax attains in the adult specimens a breadth of 23 mm., the original specimen of *Goniocaphyra* has not yet half that size. In the adult male the hands, especially the larger one, seem to present a somewhat different form as in the younger male and in the female. This observation is the result of a comparison of the drawing of Milne Edwards with my own figures and a female specimen from the Pacific Ocean, which I have before me. The cephalothorax of this latter specimen is 12 mm. broad. According to the drawing of Prof. Milne Edwards, the fingers of the larger hand of the adult male are little more than half as long as the palm, whereas they are exactly as long as the palm in the young male specimen I have described. The fingers should be, moreover, comparatively higher and less slender in the adult male than in the young and in the female.

Catoptrus nitidus A. Milne Edw. has been recorded from the Javan Sea and from the Samoa Islands.

16. *Xenophthalmodes Moebii* Richters.

(Pl. 3, fig. 5).

Xenophthalmodes Moebii, Richters, Beiträge zur Meeresfauna der Insel Mauritius und der Seychellen, 1880, p. 155, Pl. XVI, fig. 28, Pl. XVII, fig. 1—5.

A single male from the Red Sea, collected by Mr. J. A. Kruyt at Djeddah.

On this interesting form the following may be remarked.

According to Mr. Richters the corneae of the eyes should be entirely obliterated in this species, which therefore should be perfectly blind. In the Djeddah specimen, however, I observe an extremely small, punctiform, dark-coloured cornea (fig. 5), placed near the external extremity of the lower margin of the orbits; this minute cornea may best be seen when light falls in an oblique direction upon it and then it appears, under a magnifying-glass, as a black point. Richters does not say much about the external foot-jaws, but in his figure 5 the anterior and the external margins of the merus-joint seem to make together a continuous arcuate line. In our specimen, however, the merus-joint (fig. 5*a*) is distinctly quadrangular, the anterior margin nearly straight or very slightly arcuate, a little oblique and somewhat longer than the external margin; there is a distinct angle between the two margins, and the palp is inserted at the antero-internal angle of the joint.

A third difference finally presents the abdomen (fig. 5*b*), the third, fourth, fifth and sixth joints of which are somewhat shorter and appear therefore more enlarged than in the figure given by Richters; the terminal joint is a little longer, than it is broad at the base.

For the rest our specimen agrees perfectly well with all what Richters says and figures, and I therefore suppose our specimen to belong to the same species.

The whole animal is of a pale grayish colour and the upper margin of the mobile finger of a porcelain-white.

The cephalothorax is, posteriorly, 11 mm. broad and $8^1/_5$ mm. long. The specimen of Richters had about the same size.

17. *Geryon trispinosus* Herbst.

(Pl. 4, fig. 6).

Cancer trispinosus, Herbst, Krabben und Krebse, Bd. III, Heft 3, p. 43, Pl. LVII, fig. 4 (1803).

Chalaepus trispinosus, Gerstaecker, Carcinologische Beiträge, in: Archiv f. Naturgeschichte, Jahrg. XXII, 1856, p. 119.

The Leyden Museum Collection contains one single male specimen of this rare and interesting crab, of which, as far as I know, only one other specimen exists, viz. the original specimen of Herbst's *Cancer trispinosus* in the Royal Museum of Berlin. Unfortunately the origin of the Leyden Museum crab is quite unknown. Herbst indicates the East-Indies as the habitat of his *Cancer trispinosus*. The other species of the genus *Geryon* occur in the European seas and in the Atlantic Ocean: all are deep-sea forms. It appears, for that reason, very probable to me that *Geryon trispinosus* Herbst represents this genus in the depths of the indo-pacific seas, and that therefore only two specimens have been collected until to day.

Gerstaecker created for this species the genus *Chalaepus*, but it is without any doubt a true representative of the genus *Geryon*, established by Kröyer in 1837. Three species of this genus were known up to this date, if we exclude *Geryon incertus* Miers from the Bermudas, the true place of which is still uncertain: they are *Geryon tridens* Kröyer from the northern European seas, *Geryon quinquedens* Smith from the East Coast of the United States, and *Geryon longipes* A. Milne Edw. from the Mediterranean and North Spanish coasts.

I have to express my thanks to Dr. Hilgendorf of Berlin, from whom I have received most valuable informations regarding the specimen of Herbst. The latter presents some slight differences, which are either individual or must be

attributed to the somewhat larger size of the crab of the Berlin Museum.

The cephalothorax (fig. 6) is hexagonal, moderately convex in the antero-posterior, and slightly so in the transverse direction. Only a part of the regions are indicated. The posterior half of the mesogastric and the anterior half of the cardiac region are defined laterally by shallow grooves, but there is no transverse groove between these two regions. The cardiac region is separated posteriorly from the branchial regions by somewhat erose and uneven shallow impressions, which separate it also from the intestinal region. On each side of the mesogastric region a short impressed line is seen anteriorly, with a punctiform impression at the internal extremity of each line. A shallow depression, bearing two verrucous eminences, separates the hepatic from the branchial regions and the latter are somewhat erose and uneven in the middle. The anterior declivous part of the upper surface presents no interregional grooves at all. The upper surface is smooth and glabrous, though it is rather irregularly punctate and marked with numerous shallow and small impressions, which give it here and there an erose appearance.

The cephalothorax is a little broader than long, and the proportion of the distance between the third antero-lateral teeth and the length is about as 4 : 3. The front is obliquely directed downward and measures about a fifth of the distance between the posterior antero-lateral teeth. Its rather sharp anterior margin terminates in four small obtuse teeth, the external of which forms the internal angles of the orbits; the median teeth are placed close together and project a little more forward than the external ones. These frontal teeth are a little more prominent in the specimen of Herbst than in that of Leyden. The front is flattened and smooth, and presents no trace of a frontal furrow. The breadth of the front between the tips of the external teeth is a little larger than the width of the orbits between their inner and outer angles.

The upper orbital margin presents traces of two fissures, but appears for the rest entire. The outer angles of the orbits are dentiform and acute, and project a little less forward than the external frontal teeth.

The antero-lateral margins (fig. 6*b*) are shorter than the postero-lateral ones and measure only two thirds of the latter. They are armed behind the dentiform, external orbital angles, with two acute teeth, of which the posterior one is somewhat larger than the other. This third or last tooth is comparatively a little longer and larger in the specimen of Herbst than in our somewhat younger individual. The first antero-lateral, i. e. the extraorbital tooth, is somewhat flattened above, the two posterior ones slightly convex. The distance between the tips of the first and the second antero-lateral teeth is but little smaller than the distance between the second and the third. The lateral margin of the cephalothorax appears very slightly convex between the first and the second as well as between the second and the third antero-lateral teeth. In the original specimen of Herbst the lateral margin is quite straight between the first and the second teeth, slightly convex between the second and third; in this specimen the anterior margin of the third tooth forms almost a right angle with the lateral margin, in our specimen, however, a concave arcuate line. The postero-lateral margin is obtusely carinate anteriorly, but this obtuse carina disappears backward and the posterior margin of the cephalothorax is almost as broad as the distance between the second antero-lateral teeth. The lower margin of the orbits (fig. 6*a*) is concave and entire, and terminates in an acute prominent tooth, which projects about as much forward as the external frontal teeth. The eyes, antennulae, antennae and epistome are very much like in *Geryon tridens*. The second joint of the antennal peduncle is a little shorter than the basal joint and reaches almost to the upper surface of the front; the third joint measures about two thirds of the length of the

second. The endostome is distinctly ridged. The merus-joint of the outer foot-jaws (fig. 6*c*) is as long as it is broad at base; its anterior margin as well as the antero-external angle is rounded and the external margin very slightly concave. The penultimate joint of the palp is only a little shorter than the terminal joint, and the exognath reaches almost to the rounded antero-external angle of the merus-joint.

The pterygostomian regions, the sternum and the abdomen are smooth and glabrous. The sternum is almost as long as broad and the two anterior segments are coalescent. The abdomen of the male (fig. 6*d*) resembles that of *Geryon longipes* A. Milne Edw. as regards its outer form; it is seven-jointed, all the sutures being distinct, but the third, fourth and fifth segments seem to be coalescent and immobile. The two first segments cover the whole width of the sternum between the bases of the fifth ambulatory legs; they are less broad than the third segment, which is the broadest of all. The fourth, fifth and sixth segments are subequal in length, the lateral margins of the penultimate segment slightly convex. The form of the terminal segment differs a little in our specimen and in that of the Berlin Museum. In our specimen it is broadly triangular, the length measuring only two thirds of the breadth at base; the lateral margins are very slightly concave and the posterior margin occupies exactly the anterior margin of the penultimate segment. In the specimen of Berlin the terminal segment is comparatively less enlarged and more narrowed anteriorly, the lateral margins being more distinctly concave; the length measures four fifths of the breadth at base, and the posterior margin is a little shorter than the anterior margin of the penultimate segment.

The anterior legs are moderately robust and the right leg is a little larger than the left, as in the specimen of Herbst. The upper margin of the arms bears a very small spiniform tooth at some distance before the distal end;

the other margins are obtuse, rounded and unarmed. The upper surface of the wrist is somewhat uneven and presents a very acute spiniform tooth at the internal angle.

The larger hand is two and a half times as long as high and the fingers are a little shorter than the palm, which is about a third longer than high. The outer surface of the palm is slightly concave above in a longitudinal direction, rather convex in the middle and at the rounded under margin; the upper margin is rounded. The fingers are slightly compressed and have pointed crossed tips, the upper margin of the dactylus is arcuate, rounded and smooth; the inner margin is armed with ten or twelve teeth, of which the proximal one is somewhat larger than the others. The inner margin of the immobile finger presents nearly the same number of teeth, which also decrease in size towards the tip of the finger.

The smaller hand resembles the larger, but the fingers are slightly longer than the palm. The anterior legs are smooth and glabrous.

The ambulatory legs are slender and elongate. The legs of the third and fourth pair are equal in length and longer than those of the two other pairs; the second pair is the shortest of all. Gerstaecker's description is inexact, when he says that the meropodites of the fourth and fifth legs have almost the same length and that the meropodite of the third pair is the longest of all. The mero-, carpo- and propodites are strongly compressed laterally; the slightly arcuate upper margin of the meropodites ends at the distal end in a small sharp tooth. The carpopodites and the propodites of the four pairs of ambulatory legs present, with regard to their length, the same proportions as the meropodites. The very slightly arcuate dactylopodites are compressed laterally and also in the antero-posterior direction, and their upper or outer margin is slightly concave longitudinally. The ambulatory legs are apparently smooth and glabrous.

Our specimen, like that of Berlin, is of a pale bone-

colour; the figure of Herbst is too dark, as is already observed by Gerstaecker.

I give here the dimensions of the two specimens:

	Leyden.	Berlin.
Distance between the tips of the third antero-lateral teeth (= breadth of the cephalothorax)	90 mm.	99 mm.
Distance between the tips of the first antero-lateral teeth (extraorbital teeth)	50½ »	51½ »
Distance between the tips of the first and of the second antero-lateral teeth . .	15 »	15 »
Distance between the tips of the second and of the third antero-lateral teeth .	17 »	
Distance between the tips of the first and of the third antero-lateral teeth (= length of the antero-lateral margin)	31 »	
Length of the postero-lateral margin .	44 »	
Length of the posterior margin of the cephalothorax	64 »	
Length of the cephalothorax, without the median frontal teeth	70 »	76½ »
Distance between the tips of the inner sub-orbital tooth and the extraorbital tooth	12 »	11 »
Distance between the tips of the external frontal teeth (breadth of the front) .	18 »	18½ »
Length of the sternum	52 »	
Breadth of the sternum	48 »	
Length of the terminal segment of the male abdomen	7½ »	8 »
Breadth at base of the terminal segment of the male abdomen	12 »	10 »
Length of the larger hand	69 »	
» » » palm of the larger hand	36½ »	
Height » » » » » » »	27 »	
Length of the meropodites of the first right pair of ambulatory legs . . .	49 »	50 »

	Leyden.	Berlin.
Length of the meropodites of the second right pair of ambulatory legs . . .	60 mm.	58 mm.
Length of the meropodites of the third right pair of ambulatory legs . . .	61 »	58 »
Length of the meropodites of the fourth right pair of ambulatory legs . . .	55 »	$51^1/_2$ »

As I already observed above, the two specimens do not fully agree with one another as regards the dimensions. Firstly in the Leyden specimen the distance between the extraorbital teeth is a little larger in proportion to the length of the cephalothorax and to the distance between the third antero-lateral teeth than in the specimen of Berlin. The ambulatory legs seem to be comparatively a little shorter in the specimen of Herbst than in that of Leyden and the meropodites of the last pair of legs are comparatively a little longer in proportion to those of the other legs in our specimen than in that of Herbst.

Dr. Hilgendorf adds that the meropodites of the left legs of the Berlin specimen are all together one millimetre shorter than those on the right side.

The four species of the genus *Geryon* may be distinguished as follows:

Lateral margins with five teeth. Front exactly as broad as the orbits . . . . . *quinquedens* Smith.

Lateral margins tridentate. Front distinctly broader than the orbits.

- Antero-lateral margins a little shorter than the postero-lateral and concave between the antero-lateral teeth . *tridens* Kröyer.
- Antero-lateral margins slightly convex between the antero-lateral teeth, which are comparatively . . . large: *longipes* A. M. Edw. [1])
- Antero-lateral margins slightly convex between the antero-lateral teeth, which are comparatively . . . small: *trispinosus* Herbst.

1) Victor Carus (Prodromus Faunae Mediterraneae. Pars II, 1885, p. 522) quotes *Geryon longipes* as identical with *Geryon tridens*.

18. *Macrophthalmus crassipes* H. Milne Edw. (Pl. 4, fig. 7—9).

Macrophthalmus crassipes, H. Milne Edwards, in: Annales Sciences Naturelles, T. XVIII, 1852, p. 157.

One male specimen from the Carolines.

I will remark the following about this rare form, which is only known by the short diagnosis of Milne Edwards. I have before me a type specimen (♂) of *Macr. crassipes* M. Edw., received from the Paris Museum, a type specimen (♂) of *Macr. dilatatus* de Haan from Japan, and several specimens (♂ and ♀) of *Macr. carinimanus* Latr., on which I have published some remarks ten years ago (Notes from the Leyden Museum, Vol. II, 1880, p, 69). In that note I have compared *Macr. carinimanus* Latr. with *Macr. dilatatus* de Haan and I now wish to indicate the differences between these two forms and *Macr. crassipes*.

The cephalothorax of *Macr. crassipes* most closely resembles that of *Macr. dilatatus*, as regards its general form, the granulation of the upper surface, and the number, form and direction of the antero-lateral teeth. I cannot, indeed, find any other difference than that the fissure between the external orbital angle or first antero-lateral tooth and the second tooth is a little narrower in *Macr. crassipes*.

The eye-peduncles of *Macr. crassipes* reach as far as the external orbital angle, but are a little shorter in the species of de Haan and do not reach the extremity of the first antero-lateral tooth. The interregional grooves are equally developed in both species, and the granulation of the upper surface is also quite the same, two granular tubercles being observed on the postero-lateral sides.

Both species fully agree with one another as regards the direction of the upper margin of the orbits, which is somewhat oblique, so that the extremity of the external orbital angle projects much less forward than the upper orbital margin.

In both species the antero-lateral margins are armed with two teeth behind the acute external orbital angle, of which the anterior one is considerably larger than the third.

Macr. crassipes and *Macr. dilatatus* may be distinguished at first sight by the different structure of the hands of the male (and probably also of the hands of the female). The upper margin of the arms presents a few small sharp teeth in the middle, in both species, and in both forms the inner surface of the wrist is bispinose, bearing namely one acute tooth at the inner angle of the upper surface and the other at the inner angle of the under surface. The hands much resemble one another as regards their general form (fig. 7 and 9). The fingers are shorter than the palm and deflexed in both forms. The outer surface of the palm (fig. 7) appears nearly smooth for the naked eye in *Macr. crassipes*; a fine granulation however is observed covering the whole outer surface, when the latter is examined under a magnifying-glass, and these granules increase somewhat in size towards the articulation with the wrist. The upper margin of the palm is finely granulated. [1]) In *Macr. dilatatus* on the contrary the upper half of the outer surface of the palm (fig. 9) is strongly, though rather thinly, granulated, the granules are visible to the naked eye and they are separated by a transverse ridge of larger granules from the smooth and concave middle part of the outer surface; that concave part is bordered below by a granulated longitudinal ridge, which proceeds upon the immobile finger, and exists also in *Macr. crassipes*. The upper margin of the palm bears several prominent and sharp conical teeth in the species of de Haan. The

1) In our specimen from the Carolines (fig. 7*a*) the fingers are a little more deflexed and leave, when closed, a somewhat wider hiatus between them than in the Paris type specimen (fig. 7). This slight difference may perhaps be explained by the larger size of the Paris specimen.

upper margin of the mobile finger of *Macr. dilatatus* is straight and distinctly granulated; the inner margin has numerous very small teeth, but no large prominent one. The inner margin of the index presents also numerous very small teeth and no large one. In *Macr. crassipes* the dactylus is rather strongly arcuate and smooth, even at the upper margin; the inner margin presents some small teeth, of which one quite at the base is a little larger. The immobile finger is armed with a prominent tooth in the middle of its inner margin, the tip of which tooth descends obliquely to the proximal end of the finger and perpendicularly to the distal end. The inner surface of the palm is armed in both species with a spine and densely covered with hairs, like the inner surface of the fingers.

Macr. crassipes M. Edw. is also closely allied to *Macr. carinimanus* Latr. The cephalothorax of the latter differs from the cephalothorax of *Macr. crassipes* especially by the less oblique direction of the upper orbital margins, so that the external orbital angle, which is directed obliquely outward, projects as much forward as the upper orbital margin, which is not the case in *Macr. crassipes*. The incision which separates the external orbital angle or first antero-lateral tooth from the second, is much narrower in *Macr. crassipes* than in the other. Both species resemble one another as regards the granulation and the structure of the upper surface, and two granulated eminences are observed on the postero-lateral sides in both forms.

The hands of *Macr. carinimanus* (fig. 8) are however longer and more slender than those of *Macr. crassipes*, the palm being nearly four times as long as high in the former, but only about twice as long as high in the latter species. The proportion between the length of the palm and of the fingers is about the same in both forms. The outer surface of the palm is finely granular above and towards the articulation with the wrist, and presents below, near the lower margin, a strong

granulated crest, proceeding upon the immobile finger. The inner surface of the palm is armed with a spine in both species and hairy like the inner surface of the fingers. The latter are almost as strongly deflexed in *Macr. carinimanus* as in *Macr. crassipes* and agree much in both species; the basal tooth of the dactylus however is comparatively a little broader, and the tooth of the index comparatively a little smaller than in *Macr. crassipes*. The fingers of *Macr. crassipes* are also a little more slender and the dactylus is slightly more arcuate.

The dimensions of our specimen of *Macr. crassipes* are:

Distance between the external orbital angles	$22^1/_2$ mm.
Length of the cephalothorax	$10^1/_4$ »

The cephalothorax of the Paris specimen of *Macr. crassipes* is almost 15 mm. long.

The dimensions of two males of the two other species are as follows:

	Macr. carinimanus.	*Macr. dilatatus.*
Distance between the external orbital angles.	$21^1/_2$ mm.	$26^1/_2$ mm.
Length of the cephalothorax . . .	$9^1/_2$ »	$12^3/_4$ »

Macr. crassipes H. Milne Edw. has hitherto only been recorded from the coast of New Holland.

19. *Macrophthalmus pacificus* Dana.

(Pl. 4, fig. 10).

Macrophthalmus pacificus, Dana, l. c. p. 314, Pl. XIX, fig. 4.
Macrophthalmus bicarinatus, Heller, Novara-Reise, p. 36, Pl. IV, fig. 2.

The Leyden collection contains four specimens of which the locality is unfortunately unknown, one male and three females, none of which is provided with eggs. The latter fact is remarkable, because the original specimens, described by Dana and Heller, were of a still smaller size.

The proportion of the greatest width of the cephalothorax to its length is in our specimens as 7 : 5. The upper surface is slightly convex longitudinally as well as transversely; the gastric region is defined posteriorly by the distinct cervical suture, but laterally by shallow depressions of the upper surface. Similar depressions border the anterior branchial area posteriorly and also for a part the cardiac region. The upper surface appears smooth and shining to the naked eye; when seen under a magnifying-glass of sufficient power, it appears however to be very minutely granular, especially on the branchial regions. The postero-lateral sides of the upper surface are marked with two minutely granulated, pubescent, longitudinal lines, which run parallel with each other, not far from the postero-lateral margins; a third, minutely granulated and pubescent, though much shorter line runs, on each side of the upper surface, in an oblique direction, close to and nearly parallel with the posterior margin of the cephalothorax, immediately above the insertion of the last pair of legs; finally, a fourth, somewhat arcuate line is seen immediately in front of the two described longitudinal lines, proceeding, for a short distance, transversely from the third tooth of the lateral margins. The front is obliquely deflexed and shows a longitudinal groove in the middle; it is rather narrow and its breadth measures not quite one sixth of the distance between the external orbital angles. The anterior margin of the front is very slightly arcuate. The lateral margins of the cephalothorax are sinuous, their anterior half being slightly convex, their posterior portion appearing slightly concave immediately behind the third lateral tooth. The anterior half of the lateral margins presents two incisions, the first of which is much larger and deeper than the second. The first antero-lateral lobe has an obtuse or sometimes even rounded external angle, which is the external one of the orbits, towards which the upper margin of the latter slightly rises upward. The second lobe of the lateral margins is almost twice as long as the

first, and projects more laterally, because, as I have said, the anterior half of the lateral margins runs slightly outward instead of inward. The third antero-lateral tooth is very small, acute and dentiform. The eye-peduncles measure about a third of the greatest width of the cephalothorax and scarcely reach to the external orbital angle. The inferior margin of the orbits is delicately crenulate both in the male and in the female.

The anterior legs of the male are of equal size. The upper margin and the external margin of the triquetrous arms are finely denticulate and the external surface is minutely granular. The under surface of the arms is thickly clothed with a patch of hair. The wrist has the upper surface smooth for the naked eye. The hands (fig. 10) are quite as long as the length of the cephalothorax and appear to be smooth, but their outer surface proves to be very minutely granular, when seen under a magnifying-glass of strong power. The upper margin as well as the under margin of the palm are obtuse, no longitudinal crest exists on the outer surface close to the under margin and the inner surface, which is unarmed, is thickly clothed with hair on its distal half and at the base of the fingers. The fingers measure almost two thirds of the length of the palm. The lower margin of the immobile finger forms a continuous straight line with the lower margin of the palm, the index being not at all deflexed. The outer surface of the immobile finger is flattened at the base and presents a minutely granulated, longitudinal line which proceeds near the lower margin to the end of the finger; the inner margin is armed with a row of fifteen or sixteen small teeth, of which three or four, which lie in the middle of the row, are a little larger than the others. The mobile finger appears also minutely granular, especially on the upper margin, under a magnifying-glass; the inner margin is, immediately before the middle, armed with a rather broad, prominent tooth, the inner margin of which presents six or seven denticles and just before

the horny, spoonlike excavated tip the inner margin of this finger is armed moreover with five or six very small teeth, which are smaller than the opposite teeth of the index. The excavated tips of the fingers have horny margins and are somewhat hairy.

The upper margin and the infero-internal margin of the arms of the anterior legs of the female are clothed with rather long hairs, but their under surface is quite glabrous, smooth, without a patch of hair. The inner margin of the wrist is also hairy. The hands measure scarcely two thirds of the length of the carapace, they are much smaller than those of the male and have a different form. The fingers are namely quite as long as the palm, the outer surface of which is minutely granular. The upper margin of the palm presents a longitudinal row of small granules; a granulated ridge proceeds on the outer surface of the palm close to and parallel with the under margin and is continued as a smooth ridge on the immobile finger to the tip. Immediately below this ridge the lower margin of the index is longitudinally sulcate. The upper margin of the dactylus is also longitudinally grooved. The outer surface of the fingers appears smooth, the dactylus has no denticulated lobe before the middle, but both fingers are armed with a few very small teeth, which are slightly more distinct on the lower than on the upper finger. The inner margins of the fingers are hairy along their distal half. The smooth inner surface of the palm does not present the patch of hair, which exists in the male.

The meropodites of the other legs are pubescent along their upper margin and armed with a spiniform tooth a little before the distal end; for the rest these legs have the form and structure, proper to allied species.

The two largest individuals have the following dimensions:

	♂	♀
Distance between the external orbital angles	$13^1/_3$ mm.	$15^2/_3$ mm.

Greatest width of the cephalothorax, immediately before the second incision	15 mm.	$17^1/_2$ mm.
Length of the cephalothorax . . .	$10^3/_4$ »	$12^1/_2$ »

Macrophthalmus bicarinatus Heller from the Nicobar Islands is, in my opinion, identical with *Macr. pacificus* Dana, the only difference being the presence of the two granulated lines on the postero-lateral sides of the upper surface of the cephalothorax, which are not described by Dana. We must, however, consider that Dana's specimen was very small and that a slight pubescence is distinctly seen on his figure 4 *a*, so that I suppose that the pubescent lines were indeed also present in the original specimen of the american author. Heller's figure of *Macr. bicarinatus* is bad, the cephalothorax being figured too narrow. Our species is most closely allied to *Macr. tomentosus* Eyd. & Soul. and I at first thought our specimens to be young individuals of that species of which an adult male from the Mergui Archipelago lies before me. The species of Eydoux and Souleyet presents indeed almost the same form of the cephalothorax, but nearly the whole upper surface is distinctly granulated, the immobile finger of the hands of the male is slightly deflexed and the inner margin of this finger is armed with a strong tooth a little before the middle, whereas the tooth of the dactylus is much smaller and placed close to the articulation.

20. *Myctiris longicarpus* Latr.

Myctiris longicarpus, Milne Edwards, in: Annales Sciences naturelles, Tome XVIII, 1852, p. 154.

Myctiris deflexifrons, de Haan, Fauna Japonica, Crustacea, p. 25 (sine descriptione).

Two specimens, locality unknown.

The cephalothorax of the larger specimen has a length of 25 mm., so that this individual may be considered to be adult. The wrist of the anterior legs presents a longitudinal groove on its upper surface, which is situated close to the internal margin. The fingers are about twice as long as the horizontal length of the palm, the dactylus is armed with a triangular obtuse tooth near the articulation with the palm, and the inner margin of the index is granular along its proximal half. The upper and lower margins of the hand are carinate and two other divergent crests, prolonged to the tips of the fingers, are observed on the outer surface of the palm.

21. *Leptograpsus Ansoni* H. Milne Edw.

Leptograpsus Ansoni, H. Milne Edwards, Annales Sciences Naturelles, 3e Série, T. XX, 1853, p. 172.

Mr. Kingsley in his „Synopsis of the Grapsidae" (Proc. Acad. Nat. Sciences of Philadelphia, 1880, p. 197) regards this species as identical with the common indo-pacific *Leptogr. variegatus* Fabr. The author considers moreover *Leptogr. planifrons* Dana and even all the tridentate *Leptograpsi* of Milne Edwards, as synonyms of the same species. Now the Leyden Collection contains two specimens (♂, ♀) from Valparaiso, which differ from a typical male specimen of *Leptogr. variegatus* M. Edw., kindly sent to me by Prof. Milne Edwards, and collected at the Marquesas, firstly by a slightly more quadrate carapace, of which the external orbital angles are a little more distant from one another in proportion to the greatest width of the cephalothorax, so that the latter appears a little broader anteriorly with less arcuate lateral margins; secondly by the somewhat more slender shape of the ambulatory legs, the joints of which are a little less enlarged. I, for that reason, suppose our specimens to

belong to a different species and I think they belong to *Leptogr. Ausoni* H. Milne Edw., which inhabits the island of Juan Fernandez. For the rest our specimens seem to agree fully with *Leptogr. variegatus*. I cannot say whether the hands are less tuberculate or not, because the male individual is a young one and the other a female.

Leptogr. planifrons Dana is also distinct, as I suppose, the cephalothorax appearing on the figure of this species (Dana, Pl. XXI, fig. 3) even still slightly narrower anteriorly than in the type specimen of *variegatus* and the ambulatory legs appear much less slender than in our Valparaiso specimens. This species, however, may prove to be identical with *Leptogr. Gayi* M. Edw., or perhaps with *Leptogr. variegatus*, which is recorded by Miers from Valparaiso. (Miers, Report on the Brachyura of the Challenger Expedition, p. 257).

Dimensions:	N°. 1. ♂	N°. 2. ♀	N°. 3. ♂
Greatest width of the cephalothorax	33 mm.	44 1/3 mm.	44 1/3 mm.
Distance between the external orbital angles	24 1/3 »	32 1/4 »	30 1/4 »
Breadth of the front, immediately before the external postfrontal lobes	13 1/2 »	17 1/2 »	17 1/3 »
Length of the cephalothorax	29 »	37 1/3 »	38 »
Length of the meropodites of the antepenultimate pair	21 »	26 1/2 »	26 »
Breadth of the meropodites of the antepenultimate pair	9 3/4 »	11 1/3 »	13 1/4 »

N°. 1 and N°. 2 are the two specimens of *Leptogr. Ausoni* M. Edw., N°. 3 the Paris specimen of *Leptogr. variegatus* (Fabr.) M. Edw.

Only by the examination of a large number of specimens from the Chilian Seas this question can be resolved.

22. *Pachygrapsus crassipes* Randall.

(Pl. 5, fig. 11).

Pachygrapsus crassipes, Randall, Journal of the Academy of Natural Sciences of Philadelphia. Vol. VIII, 1839, p. 127.

Pachygrapsus crassipes, Kingsley, in: Proceed. Acad. Nat. Sciences of Philadelphia, 1880, p. 199.

? *Leptograpsus gonagrus*, H. Milne Edwards, Annales Sciences Naturelles, T. XX, 1853, p. 173.

Two specimens, a male and an ova-bearing female, collected by Mr. A. Forrer in the Gulf of California.

The cephalothorax of this species is somewhat broader than long, the proportion of the greatest width to the length being as 6 : 5. The distance between the external orbital angles is nearly exactly as long as the length of the cephalothorax. The upper surface is somewhat convex anteriorly as well as transversely. The cervical suture, bordering the gastric region posteriorly, is distinctly developed, and shallow depressions define the cardiac and intestinal regions; a shallow groove proceeds in an oblique direction from the base of the epibranchial teeth to the transverse groove which separates the gastric and cardiac regions, but does not quite reach that groove. In front of this oblique groove another oblique and shallow depression is observed, bordering the gastric region laterally. In the male the front is exactly half as broad as the greatest width of the cephalothorax, in the female a little broader; the front is obliquely inclined and its lateral margins diverge slightly backwards. It is rather prominent, the delicately granulated anterior margin is straight in the middle, but slightly emarginate towards the lateral angles, which appear obtusely dentiform, though projecting not so far forward as the straight middle part of the margin. The four postfrontal lobes are prominent, tuberculiform, the two internal ones a little broader

than the external and separated from one another by a longitudinal furrow with nearly parallel margins, issuing into the mesogastric area; the external lobes are separated from the internal ones by shorter and less deep grooves. The whole upper surface, with the exception of the cardiac and intestinal regions, is marked with a large number of elevated lines, which on the gastric region have a transverse, and on the branchial regions a somewhat oblique direction. Similar lines exist also on the postfrontal lobes, where they are more prominent; the upper surface of the front is marked with a few small transverse granules. For the rest the upper surface of the cephalothorax is smooth and glabrous. The lateral margins are arcuate and convex, and armed anteriorly with two stout and acute teeth, the anterior of which is larger than the posterior and forms the outer orbital angle.

The inferior orbital margin is minutely denticulate along its whole length and presents a narrow hiatus, fissure or emargination at the base of the external orbital tooth.

The inner suborbital lobe is very small and triangular. The basal joint of the outer antennae is strongly produced at its antero-external angle, which is obtuse or rounded and reaches as far as the inner suborbital lobe. The epistome is very short. The merus-joint of the widely gaping outer foot-jaws is as long as broad; the antero-internal angle of it is much produced.

The sides of the under surface of the cephalothorax are marked with oblique elevated lines; the pterygostomian regions present a few minutely granulated, short lines and are slightly pubescent.

The anterior legs of the male specimen are large, stout and equal. The anterior margin of the slightly concave inner surface of the arm is produced, distally truncate and dentate; the inner and the external sides are transversely rugose. This is also the case with the upper surface of the wrist, which is armed with a short acute tooth at the inner angle. The hands are quite as long as

the length of the cephalothorax. The palm is once and a half as long as the horizontal length of the fingers and as long as high; the outer surface is convex and perfectly smooth, presenting only a faint longitudinal line on the lower part, which proceeds somewhat obliquely from the articulation of the wrist to the tip of the immobile finger. The upper surface of the palm is margined above and the inner surface presents a few oblique rugose lines immediately below that margin. The upper margin of the dactylus is somewhat rugose at the base, for the rest the fingers are quite smooth; their tips are excavated and the inner margins feebly denticulated. Much smaller are the hands of the female, measuring only about two thirds of the length of the carapace; the fingers are as long as the palm and the latter is marked with some oblique rugose lines below near the articulation of the wrist. The ambulatory legs are short and stout. The meropodites of the last pair of legs have the distal angle of their inferior margin rounded; those of the penultimate pair present slight traces of two or three teeth; these small teeth, finally, are rather distinct at the distal angle of the inferior margin of the meropodites of the two anterior pairs. I may add that the meropodite of the right leg of the last pair in our male specimen shows faint traces of two teeth, which I have figured, whereas this limb is rounded on the left side. The dactylopodites are short, stout and spiniferous. The legs are nearly glabrous, only a few rows of short hairs being observed on the upper and lower surfaces of the carpopodites and propodites. The upper surface of the carapace is marked, on a violet-reddish ground-colour, with yellowish spots and lines, especially on the branchial, mesogastric, cardiac and intestinal regions. The anterior legs present a reddish ground-colour above, and are marked with yellow; the hands have a yellow outer surface, showing reddish reticulate lines on its upper part. The ambulatory legs present yellow markings on a reddish-violet ground-colour.